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Typologies or Similar in Barcelona and Maresme Region**

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ABSTRACT

Barcelona and its surroundings has a lot of old constructions that reminds or recreates the "Masia", old typical farms and countryside houses, that spread out along all the countryside, a lot of them were reformed by the high class, to make their summer houses near Barcelona, along the 19 century and in the first decades of the 20th century. Some of them were new constructions that copy directly the style and the formal conception of this typological house so there are a lot of "Masia" remakes, in Barcelona municipality and in towns nearby like, in the coast of the Maresme region, with non-historically interest but recognizable as formalization of the Masia profile. Of course we have some beautiful examples of the great modernist architects like Puig i Cadafalch, Josep Maria Jujol, Domènch i Montaner, who reformed some of them, and become masterpieces of the "Modernisme". This three study cases are a rethink style Masias, designed and constructed in the 1930, and 1970 and in the 1980, one in Barcelona and the others on the Maresme coast. Our office did refurbishment this "masias", in this last 5 years that illustrated some dramatic rehabilitation examples, of these peculiar buildings, for a contemporary house use. Two of them were an imitation of the typological "Masia", on the Maresme region, and the third one was an old reformed "Masia" in the Sarrià-Sant Gervasi District condemned to be destroyed but reformed with a new constructive philosophy.

Keywords: Masia, Barcelona, rehabilitation.

Introduction: History and Evolution of the Architectural Type

The known as the “Masia” the farm housing in Catalonia, is a typology of existing rural housing throughout the east of the peninsula and south of France. They are constructions for families that worked the surrounding land and with also livestock; normally these were isolated farms, very common throughout Catalonia. In an architectural way the outstanding cubic volume characteristic of these farm houses makes them become an important visual and identity element in the Catalan landscape.

They are important constructions made of stone, brick and originally grouted with mud, then also with lime and cement. They were always built with a main facade to the south with the characteristic roof gable roof. The facades were sometimes colored with different earth tones. With load-bearing walls of 30cm in thickness up to half a meter or more. Normally they have rectangular plants of bays of approximately 5 meters and covered with structure of trusses of wooden beams. Some introduced vaults if they were more important families, but normally the ceilings always flat. With two plants, sometimes a third one, where the grain was stored, on the ground floor the animals and on the first floor was situated the house. They had small underground cubicles to store wine (cellar) and food at a constant temperature, usually dedicated to growing vines.

In the Maresme district of Barcelona and coastal area object of our study, the climate is mild, not very rainy, sometimes with intense but short rains, with the increase of population and industrial activities, many “Masias” have been swallowed up by urbanizations, transformed into restaurants or have even disappeared. In Maresme there are “Masias” with defensive stone towers and reinforced walls to protect the construction of the sea, but at the same time, those that were more withdrawn, had larger windows, arcades, forming pleasant galleries that facilitate the currents and renewal of the interior air, sundial and balconies.

Figure 1. *Iconic “Masias”*



Intervention Criteria XIX and XX Century

The traditional type of masia was improve and adapted to the new requirements and throughout the 19th century this meaning changed. The result was an incredible transformation of this architectural built, the concept change of the vernacular farmer to a high class vacation housing. Of this ages there are magnificent examples of transformation of great architects such as Jujol (collaborator of Gaudi), Domènech i Montaner and Puig i Cadafalch.

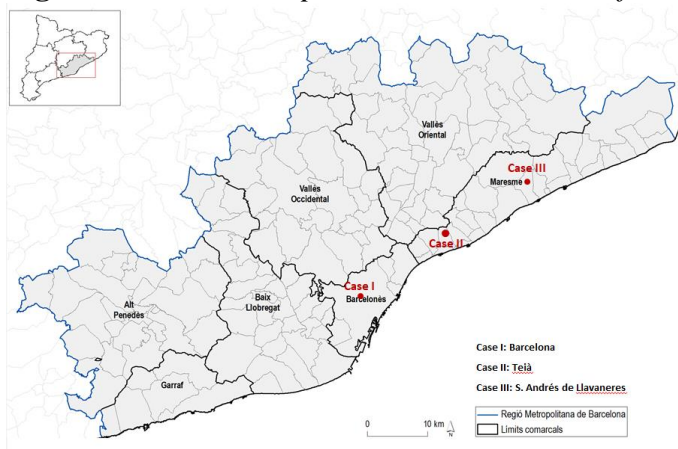
Figure 2. *Two Restored “Masias” by Jujol Architect, and the Last Figure is a Moncunill Architect Work*



The increase of the known like the second homes in the twentieth century, propitious the development of this region and were restored and built new "Masias" or at least houses with that type, adapted to use as a summer home. These types of constructions were built throughout the 20th century.

Regardless of its historical artistic or even architectural interest, his profile and what they had represented in the past, it seems enough for us that this typology, although transformed, can continue to dot the landscape as timeless witnesses of the type of housing and occupation of the territory in a dignified and recognizable way. In our office we have had the opportunity to work in three buildings of this typological characteristics: one in the of Barcelona in the District of Sarrià San Gervasi, another in Teià, a population 25km from Barcelona, and the third is situated in the town of San Andreu de Llanerres at 42 km. from Barcelona.

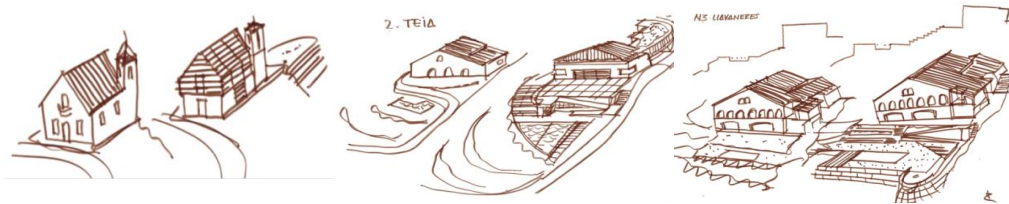
Figure 3. *Situation Map with the Three Cases of Study*



Methodology: How do we Intervene in These Reform Projects?

The work methodology has been different in each case, although the scant historical interest of the three cases has made possible a very important intervention introducing design criteria and requirements of sustainability and comfort of the current buildings.

Figure 3. *Sketches Before and After the Intervention in the Three Case Studies*



The first case of study is a very forceful intervention but respecting the volume of the existing building to respect the volumetric image in an interesting building environment. Is the only “authentic” “Masia” of the three study cases that we reform, built up on the 30s.

The second case of study is an intervention on a typological copy of a “Masia”, but with no architectural and artistic interest, but with an exceptional location at 200m above sea level, however we keep the profile of the main façade, giving it the importance that it has have through the frontal opening of large windows towards the views of the Mediterranean, and there is a large extension to the north orienting the new body to the southwest with the bedrooms and their terraces but with privacy.

The third intervention still in process, is a house built in the 70s, also with the type of farmhouse “Masia”, in this case ,quite well proportioned, with a nice gallery and also with an exceptional situation at 330m above sea level and excellent views to the Mediterranean. The performance has been on the outside, the roof, and now we are working at the inside. Here the idea is to create a terraced garden, preserve the exterior appearance of the house and reform the interior. It has been a work of exterior design very elaborated from the material, the light and the vegetation itself.

Study Case N° 1: Old Masia Single House Integral Reform in Barcelona, Lluçanes Street, Sarrià Sant Gervasi Districte

Figure 4. Images Before the Intervention



It is the result of a rehabilitation situated in Lluçanès street, at the Dte of Sarrià-Sant Gervasi. The building is 85 years old, and it is not cataloged, it is a rectangular shape with two floors and one tower attached to one floor of four floors. The surface was 400m² built and a little plot of 477m². Formally has farmland around him.

The previous state was a forceful building with a 30 cm solid brick wall structure thick with an open facade towards the south, with a small balcony on the access door and which the Lluçanes street car makes. The rear part has a roof top and a window. Practically all openings were rectangular with a wooden roof structure.

The general state of the building was deficient, especially to the structure of roofed wood and on the north facade with important cracks on the walls in a very degraded area of possible extension subsequent to the original. The rest of the brick factory loading walls was in an acceptable state. Even the foundations were in a good condition.

The surrounding terrain enjoys two magnificent palm trees to the southeast, which will be transplanted to the northeast. There is a part of the terrain that has a strong slope towards the northeast that communicates visually with the sacred heart and the stream.

The program is for family home of 4 members , in the main floor, study, kitchen, restroom, dining room for 20 people, big terrace to garden and the first floor; 4 rooms, two for children with terrace, one principal bedroom, and one for guest. All of them with complete bathrooms library and light roof. Also, elevator, stairs and garage and outdoor garden with pool.

The building is not cataloged; the client was in charge of building a new one, demolishing the old Masia, finally I convince him, to preserve the volume, to think that the possible partial preservation of a building of characteristic features turns out to be interesting, since it gives certain environment quality of the urban site. That obliges me to preserve the ancient tower for new uses!

So the main design criteria: a new house in an old volume, using ceramic, stucco and glass. The garden was designed to be able to assume more than 12 meters of unevenness. The use of ceramic tiles on the roof was obliged by the technical office of the Districte Sarrià- sant Gervasi.

Recalling the old and noble mansions that have always existed in Bonanova, we like it show the strong muraria structure that identifies old houses that has given character to this place. I have to share site with a group of buildings of a group of glowing stars of the architecture, as the impressive school of Jesus Maria 1897 in the background of Enric Sagnier (1858-1931) architect, nearby old houses, modernist jewelry such as Rubio and Bellver (1870-1952) on Dominic Street, and more modernly, toward us, the Güell family house designed by the genius of Jose Antonio Coderch (1913-1984), not far away and nearby a magnificent Gaudi at Bellesguard house (1900-1909) and just in front the new school of architecture school La Salle of the well-known architects Terradas brothers. What responsibility, what a joy.

Figure 5. *Plans of the Previous State with the Idea about Demolitions (Yellow) and New Work (Red)*



One of the most characteristic elements of this house was the tower that presides over the house. In order to respect and preserve this almost monastic addition, we turned it into a space of vertical communication and an exceptional point of view of a part of an old Barcelona almost disappeared.

The roof, a true key element of the project, divided into three segments, embraces the house with its appearance different parts of the façades (heads), and floods light throughout the center of the house.

This center, where the ladder is placed, receives the light, of the glass-roof. The large openings replaced the small windows. The windows close to the land almost disappear and the excessive opening of the skylights appears, they caught all the light they can and carry it in. The cover houses solar panels that will provide heat to the sanitary water and to the radiant heating. A green fence surrounds the house, with the neutrality of nature.

The proposal consists in completely rehabilitating the building, but conserving the walls of brick load and its exterior volume and also some floors, including the profile of its cover. This allows us to enjoy important interior space and elevations with a very rational and spatially fluid distribution. Natural light invade the entire center of the house from the deck.

A swimming pool is located on the terrace like a pond with the water flowing down to the garden.

The stairs are placed at the center of the plant, thus ordering all the space around them.

The main piece, living room, occupies a space along the north-west façade looking to garden like the dining room, which also faces the large northeast terrace where the pool-pond is located.

A part of the living room and dining room has a large glazed roof, accessible from the first floor and from the outside. Kitchen is faced on one side to the south.

The ground floor has four three bedrooms with terrace and for privacy, security and / or situation, they will have carpentry of ceramic slats with porch modus, and four toilets and closet area.

There is a loft of facilities taking advantage of the great height of the under roof, where some air conditioning units will be located. In the basement is located the boiler, water recycled tank, centralized aspiration other elements of facilities and the garage for two cars.

The facades will undergo an important transformation, many of the existing openings will be built, especially on the ground floor and will be new. Every part of the roof and façade has the condition of his orientation, on the south the solar cells, on the north glazed roof, at east, also sky-light over double space. The house has an excellent thermal inertia.

The design criteria of the new roof is that both the roof and a part of the facade have the same ceramic finish, as can be seen in the elevations. It is a ventilated façade with continuity on the roof. The roof it is divided into three parts, preserving the two current slopes and the careener. It has large skylights in the north to the south and east, also the sunlit plates on the south side. The two sides are modulated to a size of 140cm between axes, that is the finishing of the cover with ceramic pieces of terreal type "Maestral" model or equivalent, of 140x 20x4. With boards of 1cm, creating a ventilated roof that will descend by façade in the two hoods and partly from the north and south facade.

Throughout its width, there is a large opening of adjustable slats to ventilate the interior and to control the temperature below the skylight. Automatic slats open and close depending on the needs of the user and the climatology.

On the outside to recover the garden, it had to be filled more than 12 meters deep with lands by means of gabions and to remove tons of debris and vegetable waste. The difference between the house and the garden is saved by the overflowing of the pool located on the terrace, creating a waterfall of three meters that overlooks the garden.

Figure 6. *Images after Intervention*



In order to meet all the demands of light and solar energy, the third part of the south cover in the central part is reserved, to the solar cells. In the north central part are three skylights: one 182x 430 principal bedroom. south, one of 175x400 north ridge and one north in study of 173x 400. Above the terraces of the northern bedrooms, a lattice of pieces of terreal or equivalent of the "Autan" model is provided to work as blinds, with support of tensors every 140cm and structure of metallic straps, on structure of metallic side tubes of 50x100x3.

Tower Zone

The cover of the tower is made of metal on agglomerated countertop and a thermochip of 13.5cm and asphaltic sheet, also with the same solution as the rest. The side finish is metal profiles of UPN. The sides of the tower go with central parts of the same pieces as the roof, without isolation or equivalent. The rest of the tower will be stuccoed the same, as the façades of the main volume of the building.

Finally there is a large skylight in the north east that forms part of the ceiling of the living room, this skylight of 8m long and 150cm wide supported by 360cm IPN metal beams on which rests a piece of wall of the facade in the garden. The skylight has a tube structure of 10cm, and profiles embedded in the back loading

wall. The material will be colored aluminum with glass with a camera and laminated by the outer face.

Installations Facilities

The house have several conditioning systems: the radiant heating on the ground floor, except for kitchen, warehouse, service area and bathrooms, where the most traditional heating are being placed with murals radiators, as well as the first floor. This installation is supported by thermal solar panels located in the south panel.

Most of the facilities will be located in the existing basement. There are two independent gas boilers supported by the solar thermal system.

Bioclimatic

As discussed in the constructive memory, there are walls of 30cm massifs that are transduced with enclosures and insulation to give more thermal inertia, also the cover has inertia, with a "double layer" system or with a ventilated chamber: "Termochip" (wood plus insulation) on wooden rails, waterproofing and galvanized structure supporting ceramic pieces.

His roof as the form of a "ventilated façade", this allows to create this chamber, technically unify the support of the solar panels, the skylight, the finish of the cover, and at the same time have a space through which the tubes of the solar thermal system, protected and without being seen from the outside.

An automated control of installation systems is considered: There are adjustable louvers south-west and northwest. Those of the southwest are for the environmental and privacy control and those of the northwest respond only to privacy. The slats will be controlled electronically with a sensor in order to open and close depending on the solar time. The skylights will go with a "canopy" of screen fabric, also with motor, coordinated with the lamas of ventilation of the skylight.

In summer when the awning closes by intense solar exposure and raises the temperature, the lamas are operated to ventilate the heated zone.

In winter when the temperature drops, and in addition there is sun, the awning opens to allow all possible radiation to enter and the lamas remain closed to keep the hot air inside. Also, cross ventilation is proposed, from the basement to the controllable roof with grates, producing vertical and horizontal ventilation that crosses the entire center of the house. On the ground floor there is radiant heating, powered by thermal solar panels with a storage tank. By the way fans beneath the cover will cool in the summer, the water of the radiant heating, provide a temperature around 18-20 degrees, and cooling down the ground floor.

Study Case N° 2: “Masía” from 1980, a Single House, Integral Reform and Extension, in Diseminats Street, in the Town of Teia in the Maresme Region, Barcelona

Figure 7. *Previous Status*



This “Masía” it is located in a big farm property, on the upper part of the town of Teia, a beautiful town, with a lot of important properties of the XIX century. The house is between the “Torrent d'Aroles” stream and another unnamed stream, in the topographic levels 174m and 205m above sea level, it has forest in its upper part and orchard and garden to the southeast. It has three accesses and is delimited by perimeter fences. The house is in the level 192.50m very close to the northern lintel. It has a total of 26.252m². It is surrounded by urbanizations with constructions of all kinds, diverse volumes and also diverse qualities.

The current house is a recreation of the typology of Masia built in the eighties for vacation. Only the ground floor was habitable, and a small part of the floor, since the first floor is under cover with facilities and water tanks.

The current house did not have a garage. An enlargement was initially intended to have 4 bedrooms, a garage and a new entrance hall. It proposes the rearrangement of the access of vehicles and the landscaped environment. The project also foresee saving energy with new facilities.

Here the design criterion was to reform and expand dramatically, but always retaining the distinctive profile of the typical form of the farmhouse, that is, with a gabled roof on the front façade and makes the new extension towards the North, behind the existing house. Although this existing building did not really have any architectural value, his insertion into the landscape makes it a recognizable and well-implanted element.

Also the idea of the new extension proposal was to minimize the visual and real impact on the landscape. Finally the reform must provide the new construction with all the new facilities in the sense of sustainability.

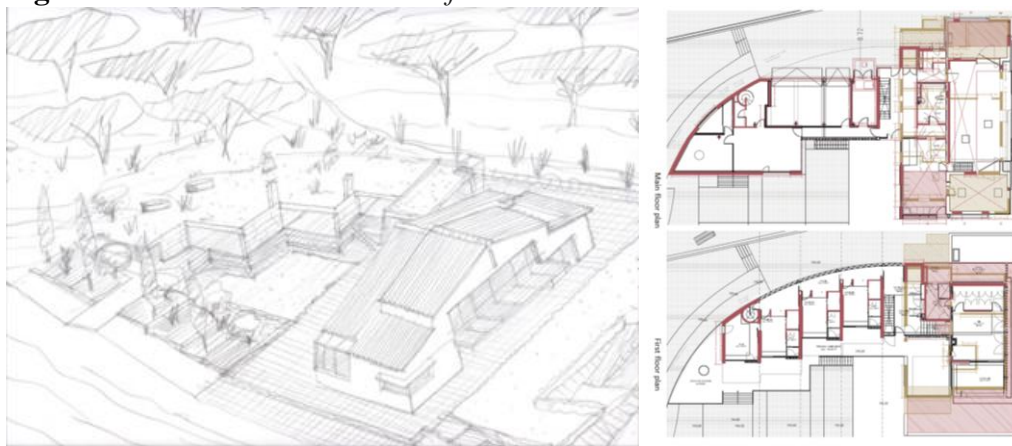
Between the new extension and the old volume is located the lobby that is the place that separates and unified all the parts of the home: garage, kitchen, living room, playroom, and the stairs and the elevator, to the upper floor to the bedrooms.

The new extension would be on two floors: The ground floor for a vestibule, garage, facilities room, and access stairs, there will also be a buried tank and the first floor with the bedrooms the hallway and the stairs of access.

This existing part is rehabilitated and it is extended to the North West with the new construction. In order to reach the maximum building volume, large terraces are created in the old building, disassembling part of the existing roofs to the west; this allows us to complete the new volume without exceeding the maximum volume permitted.

The useful total of the extension is 159.22m^2 and built of 194.44m^2 , with a volume of 526.91m^3 and an occupation of 136.05m^2 . The resulting total constructed area is 509.39sq m^2 and a total constructed volume of $1,499.45\text{m}^3$.

Figure 8. *Initial Sketch and Plans of the Intervention*



The program was an extension of the family nucleus that lives in the home, a couple with three children, plus a person who carries out the maintenance tasks of the farm, and alternatively service people, plus the current absence of garage and space necessary for installations and deposits.

Resume of the key points of the intervention and program were: Make it more sustainable, safe and modern in accordance with current standards; The current facilities do not meet the current requirements; Minimize the impact on the landscape; Not affectation of existing vegetation; Green roof cover of the new enlargement; Minimization of energy losses, biomass and solar cells; Garage and facilities space; 4 New bedrooms, spacious, bright in contact with the garden, independent but well connected to the existing home; To segregate and separate them from the best area of the house, it is currently the road access, passes in front of the main facade (south facade); Use the best outer areas of the existing house, promoting the sun and views areas; Take advantage of the magnificent views, using rationally existing spaces; Extend the garden available with non-combustible native plants; Change access to housing, the car will be on the east side out from the views and southern part of the house; Take advantage of the later flat area as the space of the expansion, and turn it into an open courtyard, but with the closed or delimited perimeter; Give consistency to the whole; To have pergolas that unify split pieces of the main construction, with the possibility to place solar panels

(thermal) that feed the need for hot water, also the possibility of photovoltaic; Take advantage of existing topography, making it more accessible; Use natural stone green marble from India, in all the house, in the floor (120cmx120cm.), in the pool, in the main bathrooms and by the façade, creating a ventilated façade with thermal inertia; Recovery of the gray water, and make the purification without chemical products; Boiler with biomass (“pellet system”), taking advantage of the forest mass of the property; Enormous wall-doors were implemented in the living room area that divide different spaces but can be opened creating a 20meter large room.

Figure 9. *Render and Actually Images of the Construction*



Outside, several interventions are proposed. We make an important enlargement of the existing pool, creating several creating small lagoons and waterfalls from the upper level to the pool, which make a soft whisper and cool the atmosphere.

There are some ramps and stretches with water that would lightly communicate with the green esplanade in front of the housing, at the height of 189.50m.

The garden slightly extends to the west to recover the oval plant guideline and give it continuity. We created four different levels, the first were terrace with the same level as the main floor, the pool level, a fruit tree zone and other open space.

As already mentioned, the “Masía” has a considerable implantation of family gardens with crops, fruit trees and vineyards maintaining the uses that in this sense already were of the property and garden near the house 640m² square meters.

In order to facilitate water savings, it has been thought about the use of rainwater for this purpose, by building a deposit of about 20,000 liters of capacity given the theoretical area of water collection and the water needs of the farm. These facilities would also be used as a reserve for prevention and work in case of forest fires that are absolutely necessary given the important part of the farm with forest.

Biomass treatment; the farm has an important wooded surface. The maintenance works of the same generate an important amount of forest waste that is worth taking advantage of “in situ” by means of a biomass boiler and / or type of “pellets” wooden pieces, which would provide hot sanitary water and heating energy throughout the house.

Study Case N° 3: Masia Typology 1970 Single House in the Town of Sant Andres de Llavaneres Maresme Region, Barcelona

Figure 10. *Previous State*



The house is an important construction with almost 1.000 square meters of constructed surface, is developed in three floors, has beautiful views over the town and the Mediterranean Sea, and a 2.000 square meter surface land with swimming pool. The entrance floor is 341 meter high over sea level.

This is a recreation of the old but important farm houses with the arcs that made more importance to the building and creates a very important space surrounding the house the characteristic “porxo”, that kind and beautiful space that creates a comfortable and ventilated living outside room, very useful in the Mediterranean climate. The façade in this case is not possible to be reformed, only can be painted.

The program: The first requirement was to work in the outside, repair roof and reform inside for one family house, with 8 bedrooms, kitchen and dining, 6-7 bathrooms, playrooms, sauna, cellar, garage, some place for the housekeeper, and a large facilities space, and also make it more sustainable, safe and modern in accordance with current standards.

The designing criterion was to preserve the façades, galleria and to make an accessible garden, with new pool, pergola, play zone and others space. Here the principal reform at the moment is on the outside. How, to turn the outer zone into useful and enhancing the strong and at the same time subtle image of the existing house.

The site where is located is the result of an important land filling to guarantee a flat surface for the construction of housing. Although the land is stabilized in much of the plot and the vegetation has been fixed with more or less success, there are parts with some problems; the most affected land is just at the end of the garden.

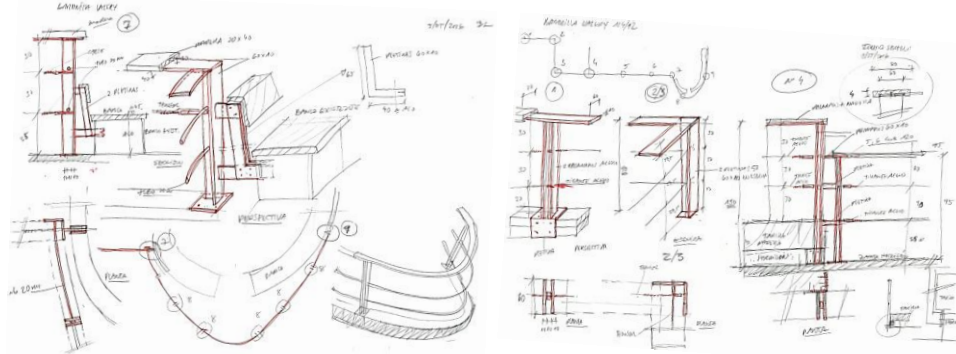
We make an important consolidation of this land in the lower part of the plot that basically consists of the construction of an important stone wall, made of natural Manresa stone, built up like a cyclopean work.

The pavement and exterior stairs will be travertine stone modulated 60x30, which is the module of all the exterior space, with ramps and rest areas, making a basement that makes the building more singular, and facilitates the access to the downside part of the garden, some like Italian, antique villas.

Different meeting areas are staggered along the slope from the level of the ground floor to the level of the pool, providing different views of the set area.

Hidden ramps facilitate the connection of different levels, all the garden is a useful combination of green area, living areas, and playground areas. All of them connect one each other in a fluid way.

Figure 11. Sketches



Regarding the closure, the entire perimeter must be securely close of the site in order to guarantee the privacy and uncontrolled flow of livestock such as wild boars. We consider that it must be a recoverable and ecological element.

A relatively short module 2 meters is considered, in order to adapt to the slope of the ground. The solution is specified in a module of 2 meters that is repeated with two levels of closure, that is a treated wooden fence to a minimum of one meter in height and a maximum of 1.20m, and another one of a maximum of 2 meters of height of network of simple torsion of 2.5 mm of thickness and an opening of 40mm, with tensors and planting screwed to hold the network and to be able to repair it and plate of 150x150 x 10mm in the base with inserts inserted into the concrete base. Between the two enclosures there would be a space of 20cm, in order to plant vines; the idea is that over time the vents grow in the internal space towards the highest part of the network and making an opaque but green closing.

The material that we use in this outside intervention where basically 3: special slices of stone on the final walls, travertine marble on the floor and stairs, and the green. Mediterranean plants like creeping rosemary, pines, lemon trees, rose's bushes, and hedges protecting from the unevenness as a handrail, are the conjugated green materials offer us the final image that we pursue. The water of the pool, as the final surface of the garden is facing the view to the Mediterranean.

At the very edge is an stunning lookout, as the keel of a ship, overlooking the town of Lllavaneres with the seaside on the horizon.

The exterior volume and opening arches are being preserved to assure and preserve the "Masia" image, though this house it can be seen from the village and at a great distance.

Figure 12. *Final Images of the Project*



Inside Reform: This part it is in progress is not the intention to be part of this article.

Conclusions

The intervention and great rehabilitation of the farm-houses, known as “masías” or the constructions that copy that characteristic typology, but constructed for other purposes, built up during the XX century, has to assume all the new requirements of now a days, such as the technological, social, environmental, but they must also try to preserve the spirit with which they were conceived.

Today, the “Masía”, as it was built for centuries, does not have the same use and meaning, although there are some houses, in inland regions that are still home to rural owners, but the most of them, are being reconverted in rural hotels, restaurants, public centers or summer residences.

However, the legacy of its construction, its implacable implantation in the territory, drawing a timeless, but recognizable landscape, forces us to respect, albeit in a subtle way, some characteristic elements of this constructive typology, whether the spatial and formal design of these magnificent rural houses, that with their overwhelming simplicity dignify the landscape of our territory.

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